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Arc discharge for carbon nanotube synthesis MICHAEL KEIDAR, University of Michigan, YEVGENY RAITSES, Princeton Plasma Physics Laboratory, LIANG TAO, University of Michigan, ABRAHAM FETTERMAN, Princeton Plasma Physics Laboratory, ANTHONY WAAS, University of Michigan — The arc discharge is one of the most practical methods for single wall nanotube (SWNT) synthesis. This method yields highly graphitized tubes, because the manufacturing process occurs at a very high temperature. Arc-produced carbon nanotubes have fewer structural defects than those produced by low temperature techniques such chemical vapor deposition (CVD). Most likely this is due to fast growth that prevents defect formation. The most important arc process for SWNT synthesis is the anode erosion. It is shown that the dependence of the anode erosion rate on arc current and background pressure can be strongly affected by the magnetic field. The effect of the magnetic field on the SWNT properties and SWNT production yield is investigated. A theoretical model suggests that a magnetic field may lead to longer nanotubes.

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